Practice 2_Suggested solution (you might have different solution that are also acceptable)

1. Find x in the following equations.

$$\frac{\frac{1}{x+1}}{\frac{1}{2x+2}} = 1$$

$$\frac{1}{2x+2} \times \frac{\frac{1}{x+1}}{\frac{1}{2x+2}} = 1 \times \frac{1}{2x+2}$$

$$\frac{1}{x+1} = \frac{1}{2x+2}$$

$$2x + 2 = x + 1$$

$$2x - x = 1 - 2$$

$$x = -1$$

However, if x =-1, the denominator of both x+1 and 2x+2 will be zero.

The equation has no solution.

$$\frac{\frac{1}{x+1}}{\frac{1}{2x+2}} = 1$$

$$\frac{1}{2(x+1)} \times \frac{\frac{1}{x+1}}{\frac{1}{2(x+1)}} = 1 \times \frac{1}{2(x+1)}$$

$$\frac{1}{x+1} = \frac{1}{2(x+1)}$$

$$2(x+1) = x + 1$$

$$2 = (x+1) \div (x+1)$$

$$2 = 1$$

Which is also impossible

$$\frac{\frac{1}{2x+2}}{\frac{1}{3x+3}} = 1$$

$$\frac{1}{3x+3} \times \frac{\frac{1}{2x+2}}{\frac{1}{3x+3}} = 1 \times \frac{1}{3x+3}$$

$$\frac{1}{2x+2} = \frac{1}{3x+3}$$

$$3x + 3 = 2x+2$$

$$3x - 2x = 2 - 3$$

$$x = -1$$

$$\text{or } 3 = 2$$

Which is impossible.

2. Express your findings as a general rule.

I find out that if the equation is in the format of the following pattern, the solution for x is always negative one (-1).

The pattern of the equation is when the numerator is $\frac{1}{(x+1)}$ the denominator should be $\frac{1}{2x+2}$ which is adding (x + 1) to the denominator of the denominator and the quotient will always be equal to 1.

However, the solution doesn't make sense since when the solution is -1 all denominator of the equation are 0.

This type of equation is not valid or have no solution.

3. Demonstrate that your general rule works for any case of the pattern.

To demonstrate my general rule works for any case of the pattern, I try to make up two more equations that fulfill the pattern I found and see if they works or not.

$$\frac{\frac{1}{3x+3}}{\frac{1}{4x+4}} = 1$$

$$\frac{1}{3x+3} = \frac{1}{4x+4}$$

$$4x + 4 = 3x+3$$

$x = -1$ or $3=4$ which is impossible

$$\frac{\frac{1}{100x+100}}{\frac{1}{101x+101}}=1$$

$$\frac{1}{100x+100}=\frac{1}{101x+101}$$

$101x + 101 = 100x+100$

$x = -1$ or $100=101$ which is impossible

$$\frac{\frac{1}{n(x+1)}}{\frac{1}{(n+1)(x+1)}}=1$$

$$\frac{1}{n(x+1)}=\frac{1}{(n+1)(x+1)}$$

$(n+1)(x+1) = n(x+1)$

$nx+n+x+1 = nx+n$

$x+1 = 0$

$x = -1$ or $n=n+1$ which is impossible

i.e. This type of equations have no solution.

I have tested my finding is correct by the solving the above 2 more equations and I have proved my general rule works for any case with a equation include general term (n).